REMARKS

Claim Amendments

No claims are amended. Claims 1-17 are presented for consideration by the Examiner.

Allowable Subject Matter

Claims 1-15 are allowed.

Claim Rejections 35 U.S.C. § 102

Claims 16 and 17 are rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,557,776 to Carroll (Carroll). Carroll discloses a fuel injector with injection rate control in which the needle valve is a complex multi-component assembly. Two coaxial needle valves 40, 42 are separately controlled to uncover first and second sets of injector orifices. A sequencing device is mounted on the injector to prevent movement of only the inner needle valve element to define a low fuel injection rate event and permit selectively, controlled movement of both the inner and outer needle valve elements to open positions to define a subsequent primary fuel injection event. (Abstract).

Rejected independent claim 16 recites in pertinent part as follows:

> "providing a pilot fuel flow path open only during a predetermined initial axial movement of said needle valve away from said closed position;
> providing a primary fuel flow path open only after said needle valve has moved through an intermediate axial position beyond said initial axial movement, said pilot fuel flow path being closed in said intermediate axial position."

Claim 16 clearly recites a relationship between axial movement of the needle valve and the recited pilot fuel flow path and primary fuel flow path. Specifically, the primary fuel flow path is "open only after said needle valve has moved through an

intermediate axial position beyond said initial said axial movement, said pilot fuel flow path being closed in said intermediate axial position."

Carroll does not disclose, teach or suggest the specific relationship between axial movement of a needle valve and pilot and primary fuel flow paths in a fuel injector as recited in claim 16. Carroll discloses independently operable inner and outer needle valve elements where movement of the inner needle valve element opens a pilot or low rate flow path and operation of both inner and outer needle valves opens the primary or higher flow rate flow path. Carroll does not disclose, teach or suggest axial movement of a needle valve through an intermediate position which closes a pilot fuel flow path before opening a primary fuel flow path "after said needle valve has moved through an intermediate axial position beyond said initial axial movement."

Claim 16 is neither anticipated nor obvious in view of Carroll. Claim 16 is patentable for at least these reasons.

Claim 17 depends directly from claim 16 and is patentable for at least the reason stated in support of that claim. Claim 17 further recites "constructing the nozzle holder body and needle valve to physically block said pilot fuel flow path at axial positions of said needle valve corresponding to axial movement greater than said predetermined axial movement." Carroll does not disclose, teach or suggest that the needle valve and nozzle holder body in a fuel injector assembly are constructed as recited in claim 17. Claim 17 is further patentable for at least this reason.

Claims 1-15 are allowed. Applicant respectfully requests allowance of claims 16 and 17 in view of the foregoing remarks.

For all the foregoing reasons, favorable consideration of claims 1-17 is respectfully requested.

Respectfully submitted,

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